

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE
BOARD OF PATENT APPEALS AND INTERFERENCES**

Application No.: 10/776,497
Filing Date: February 10, 2004
Applicant: Blaine R. Bateman
Confirmation No.: 3233
Group Art Unit: 2821
Examiner: Robert Karacsony
Title: CONFIGURABLE ANTENNA FOR A WIRELESS
ACCESS POINT
Attorney Docket: 9062A-000091/US

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY BRIEF

Sir:

In response to each of the grounds for rejection noted in the Examiner's Answer mailed April 29, 2009, the Appellant submits this Reply Brief and states as follows:

1. 1st GROUND OF REJECTION ON APPEAL

The Board should overturn the rejection of claims 1-15 and 17-19 because the cited reference *Theobald* (U.S. Patent 7,119,744) does not teach all of the claim limitations.

I. Claims 1-15 and 17-19 Are Not Anticipated Because *Theobald* Fails To Teach All Of The Claim Limitations Including a “Ground Plane” Means For Converting An Omni-Directional Antenna To A Directional Antenna.

In order to establish anticipation, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. (See *Karsten Mg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001)). The Appellant submits that *Theobald* does not anticipate independent claims 1, 13, and 17, because *Theobald* does not teach a “ground plane/means (312), which, when coupled to the access point (310), an omni-directional antenna (304, 306) functions as a directional antenna (or exhibits directional antenna radiation in the direction A), as illustrated in Fig’s 3-4 of the application shown below.

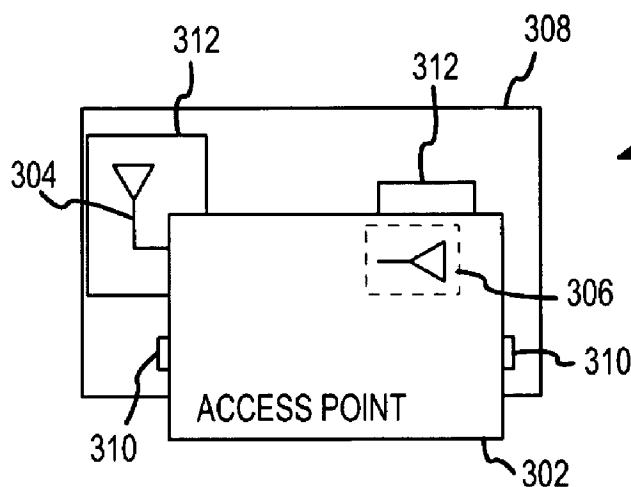


FIG.3

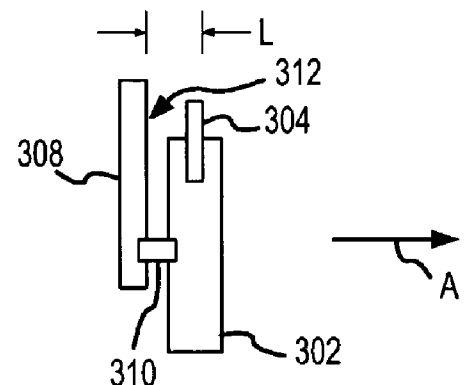


FIG.4

The Examiner's Answer asserts on page 3 that *Theobald* discloses a ground plane (20, column 3, lines 28-32, discloses passive antenna structure being reflective). But the passive antenna structure in *Theobald* relied on by the Examiner is "**composed of material for providing radio signal isolation**," which cannot reasonably be equated with a "ground plane" consistent with the specification as it would be interpreted by one of ordinary skill in the art.¹

A person of ordinary skill in the art reading the specification defining a ground plane would understand the claimed "ground plane" to mean a surface behind the antenna, that when sufficiently large behaves to provide a higher gain antenna that further functions as a directional antenna. This is supported by the Application, which states in ¶ [0025] that:

[0025] As one of ordinary skill in the art would now recognize, using ground planes 312 converts the relatively lower gain omni directional antenna 304 and the optional relatively lower gain omni directional antenna 306 into relatively higher gain directional antennas directed as shown by arrow A. Further, strategic placement of ground plane 312 behind antenna 304 and/or 306 allows for steering of the direction."

The application also states in ¶ [0024] that "Ground plane 312 is mounted a distance L from omni directional antenna(s)" and "the width of the ground plane is limited in minimum size to a size that would still function like a ground plane." Thus, a "ground plane" is a plane that is positioned a given distance behind an omni-directional antenna that provides a directional antenna with higher gain.

¹ The claims are to be given their broadest reasonable interpretation consistent with the specification as it would be interpreted by one of ordinary skill in the art. *In re American Academy of Science Tech. Center*, 367 F.3d 1359, 1364 (Fed. Cir. 2004); The Federal Circuit has maintained that a term in a cited reference cannot reasonably be construed to describe a claimed limitation in a manner that is inconsistent with that disclosed in the specification. *In re Buszard*, 504 F.3d 1364, 84 U.S.P.Q.2d 1749 (Fed. Cir. 2007).

The Appellant submits that the claimed “ground plane,” interpreted consistent with the specification as it would be interpreted by one of ordinary skill in the art, can only be construed to mean a plane that is positioned a given distance behind an omni-directional antenna that provides a directional antenna with higher gain. (A skilled artisan could also interpret the ground plane as a ground plane antenna coupled to the antenna to function like a dipole antenna).

Contrary to the claimed “ground plane” defined in Appellant’s specification as being positioned behind an omni-directional antenna to convert the lower gain omni directional antennas into “into relatively higher gain directional antennas,” *Theobold* only discloses a structure “**for providing radio signal isolation.**” The Examiner’s answer contends that “since the passive antenna structure 20 can comprise only metal reflectors, the case where the passive antenna structure is solely used as a reflector would inherently cause the omni-directional antennas 12 and 14 of *Theobold* to operate as directional antennas.” (see page 8 of Examiner’s Answer). But the “isolating structure 20” disclosed in *Theobold* provides “radio signal isolation” that inherently provides isolation between antennas 12 and antennas 14 to restrict their coverage area to less than 360 degrees. This is not the same as a ground plane that causes an omni-directional antenna to function as a directional antenna that directs an antenna’s signals.

The Appellant submits that one skilled in the art would understand *Theobold*’s isolation structure, which results in restricted antenna coverage area by isolating one antenna signal from the other, to be entirely different from the claimed “ground plane” that when coupled to the access point, “the at least one omni directional antenna functions as a directional antenna.”

As the Examiner states, *Theobald* teaches an antenna system used in two states (1) with an isolation structure 20, and 2) without an isolation structure 20.” *Theobald* does teach 1) a sectorized antenna system in which separate antenna channels are isolated from each other so as to be “non-interfering,” and an array antenna system in which “the signals of two or more 802.11(a) antennas...can be combined to operate in a “range extending mode.” (*Theobald* , col. 3, ll. 52 – Col. 4, ll. 3, col. 4, ll. 11-15). The present claims are not directed to separate antenna channels isolated from each other so as to be non-interfering, or separate antennas whose signals are combined. Rather, the present claims are directed to antennas in which a ground plane/means converts separate omni-directional antennas to a directional antennas.

The Appellant submits that the claimed “directional antenna” (provided when the ground plane/means is coupled to the omni-directional antenna) which directs an antenna’s signals, is not the same as use of an isolation structure 20 that isolates antenna signals to restrict an omni-directional antenna’s coverage. The Appellant asserts that a skilled artisan would consider a directional antenna, which has a higher gain of antenna radiation in a given direction, to be different from omni-directional antennas that are isolated to restrict their coverage area. Use of the isolation structure 20 that “results in a ‘sectorized’ antenna system in which each antenna...covers a hemispherical area” is not the same in meaning as a directional antenna having a higher gain of radiation in a given direction.

Thus, the Appellant submits that claims 1, 13, and 17 are not anticipated, because *Theobald’s* isolation structure 20 and antennas with restricted coverage cannot reasonably be interpreted, consistent with the specification as it would be

interpreted by one of ordinary skill in the art, to disclose the claimed ground plane or directional antennas.

2nd GROUND OF REJECTION ON APPEAL

The Board should overturn the rejection of claims 16 and 20 because a person of ordinary skill in the art would have not modified or combined the teachings in the references in a manner that would result in the fashion claimed.

I. Claims 16 and 20 Are Not Obvious Because A Skilled Artisan Contemplating *Theobold's* Teachings Of An Isolating Structure For Providing Radio Signal Isolation Would Not Have Modified Or Combined *Theobold* With *Song's* Teachings Of A 1/4 Wavelength Reflector Spacing For Increasing Broadside Radiation Amplitude

The Examiner's Answer contends that it would have been obvious to one of ordinary skill in the art to have spaced the passive antenna "isolating structure" and antenna elements of *Theobold* 1/4 wavelength, as taught by *Song* (U.S. Patent Application Publication 2004/0169612), in order to have increased the gain. But *Theobold* teaches separate channels in which "antennas need to be isolated by more than the isolation that physical separation provides...signal isolation between monopole or dipole antennas 12, 14 can be obtained by locating the isolating structures 20 in the interstitial spaces." (*Theobold* , col. 3, ll. 58-63). The isolating structure 20 includes absorbing foam 22 or metal reflectors 24" as illustrated in Fig. 1A shown below:

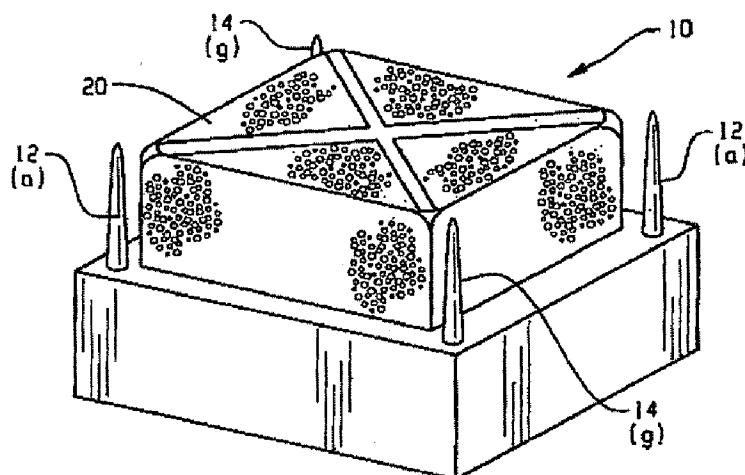


Fig. 1A

A person of ordinary skill in the art contemplating *Theobold's* teachings to provide signal isolation between antennas 12 and 14 would not have considered moving the reflectors 24 to $\frac{1}{4}$ wavelength from the antennas 12 and 14, since the whole point of *Theobold's* isolation structure 20 is to “sectorize” the system such that each antenna covers a hemispherical area of coverage, and including the $\frac{1}{4}$ wavelength would have increased broadside radiation amplitudes of the antennas that would interfere with *Theobold's* intent to isolate antennas signals to provide hemispherical coverage areas.

The MPEP states that a proposed modification cannot modify the principle of operation of a reference, and cannot render the prior art unsatisfactory for its intended purpose. MPEP 2143.01. Moreover, a combination of references is not proper where the “combination of references would require a substantial reconstruction or redesign of the elements shown in the primary reference”. MPEP 2143.01(VI). The Appellant submits that a skilled artisan contemplating *Theobold's* intent to isolate antennas signals to provide hemispherical coverage areas would not have spaced the “isolating structure” of *Theobold* $\frac{1}{4}$ wavelength, as taught by *Song*, since doing so would have increased broadside radiation amplitudes of the antennas that would interfere with *Theobold's* purpose of providing isolated hemispherical coverage areas. As such, the Appellant submits that claims 16 and 20 are non-obvious and patentable for at least these reasons.

Moreover, *Song* teaches multiple antennas that may share or otherwise utilize the ground plane or structure of other elements as part of the entire radiating structure. (see *Song*, ¶ [0034]; 201 in Fig. 2A). *Song* does not teach an independent ground plan used in conjunction with as few as one antenna to selectively achieve increased directivity. Thus, a skilled artisan contemplating

Song would still not have arrived at the claimed design, where when the at least one ground plane is coupled to the access point, the at least one omni-directional antenna functions as a directional antenna. As such, the Appellant submits that claims 16 and 20 are non-obvious and patentable for at least these reasons.

CONCLUSION

In view of the above arguments, the Appellant submits that the Examiner has not shown that claims 1-15 and 17-19 are anticipated by *Theobold*, and that the Examiner has not shown that claims 16 and 20 are obvious over *Theobold* in view of *Song*, and reversal of the present rejections is respectfully requested.

The Appellant believes that there are no fees due in connection with this filing. But the Commissioner is hereby authorized to charge any fee(s) to Deposit Account No. 08-0750. In addition, if there is ever any other fee deficiency or overpayment under 37 C.F.R. §1.16 or 1.17 in connection with this patent application, the Commissioner is hereby authorized to charge such deficiency or overpayment to Deposit Account No. 08-0750.

Respectfully submitted,

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Date: May 22, 2009

CERTIFICATE OF TRANSMITTAL

I certify that on May 22, 2009, this REPLY BRIEF was electronically filed with the U.S. Patent and Trademark Office, address to Commissioner for Patents, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450.

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